

HABITAT PROTECTION

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Documentation of species destruction has come to the fore in recent years, on both a worldwide (Eckholm, 1976) and national (Barney, 1977) basis. This raising of our collective consciousness that we are indeed stewards of the planet and all that it contains has been a rather abrupt phenomenon in the time-scale of planetary human events (Jackson, 1979). The United States now has rather far-reaching endangered species legislation, even though it was recently amended to provide for override in exceptional circumstances (P.L. 93-205, 1973). Success of the laudible aim of respect for fellow creatures and the realization that we must match our words with physical accomplishments showed clearly most recently in the Snail Darter Case. Even though the fish itself was protected by law, it would soon become extinct unless its habitat was likewise kept in its present natural state. The lesson, then, is that habitat protection is an integral part of species protection (Cahn, 1978). This conclusion may be obvious to ecologically oriented natural scientists, but alas, not so to that great group of "other" individuals who are swayed by reports on the need for more oil quickly, the need for more coal quickly, and the need for more nuclear-generated electricity quickly. Mankind itself may well become an endangered species if our life-support (photosynthetic) systems, the plant ecosystems, are not treated with enough respect to maintain their diversity.

Who should decide on where and how much of the natural ecosystems of a given area ought to be left alone in order to insure a reasonable opportunity for survival to a particular species? And is mere survival enough? As previous speakers have asked us, how do we insure enough genetic diversity in a population? These and many other questions involve often rather intimate knowledge of the biology of the species in question. Fortunately for the main thrust of the group here assembled, there are few known migratory plants. Thus we primarily need consider only specific sites, and not wintering or nesting grounds at distant geographic locations. Really it is the botanists and ecologists who work with these species who are best able to give the best technical advice on just what habitat is critical for their continued survival.

The decisions to save particular habitats, however, are seldom made directly by those who work with the area's biota. The decisions are instead made by often biologically unskilled people in largely governmental frameworks at the local, state, or national levels. Most people concerned with the direct management of private habitat-saving groups, such as land trusts, Audubon societies, and various other wildlife defenders, are often not themselves any better-versed in biology, and must depend upon the knowledge of competent scientists to help frame their decisions. Here, in my opinion, is the place where we as plant biologists, as leaders in studies of natural plant populations, have failed ourselves as well as our fellow humans. We are as much to blame for the endangered status of some of our pet study objects as anyone. Very few of us have demonstrated over the past decade through our individual or collective actions the degree of concern that was and most certainly still is needed to assure even minimal direction to land acquisition programs. Competent biologists we are, yes: but until we, these same biologists, become as concerned as we are competent, most of our endangered species will, in my opinion, continue toward extinction, inexorably joined one by one by other taxa not now even remotely considered as endangered. These endangered species — *our* species, if you will — must have human defenders if they are to survive at all. It is up to us, the botanists and ecologists who work with them, to speak out to assure their survival.

How many times has each of you in this audience participated in giving, without waiting to be asked — giving — of your scientific knowledge to your own local conservation commission or planning commission or state natural resources executive department or your state legislative committee on natural resources? Or written to any congressional committee on endangered species? Where do you suppose they can obtain information, which is accurate, sincere, and consistent with ecological principles, if not from people like you? Can't you, as a competent biologist, also become concerned about your own future, your family's future, your students' future? They are all linked, as each of us knows quite well.

I feel compelled to interject a note of caution here. Let's suppose for a moment that you not only *can* become involved, but *do*. From my own personal experience and as observations reported to me, I must warn you that while speaking out regularly and consistently on such causes generates a respect with the listeners who are the imme-

diate beneficiaries and who can translate your concerns into law and strong programs, attitudes ranging from benign neglect to downright hostility are frequently met both from one's colleagues and his or her college administrators. For instance, popular articles, regardless of how convincing they may be and how helpful they may be to the saving of habitats, are often brushed off as "unscholarly" and worthy of mention only as "gray literature", after the manner of certain rather slick corporate brochures which purport to demonstrate no lasting damage at all from some clear environmental disaster. Unless and until every one of us regards as part of his or her responsibility, job description, or incumbent duty, the education of others both inside and outside academic circles, on the needs and values of habitat preservation, our study species, and thus our livelihoods, will continue to march together toward extinction.

How does one accomplish habitat protection? First, each of us should realize that it is seldom a single-person activity. Most of us simply do not own any spare ecosystems we'd like to see preserved; even those who do own land seldom have the means to make gifts of such areas at reduced prices or perhaps with no monetary compensation at all. Yet gifts of land continue to be one of the largest aggregate sources of newly-preserved habitat each year. Gifts occur both to public and to private agencies, and under present tax laws, their value as gifts often represents a substantial tax saving for the giver, as well as to the municipality in which the gift lies through lowered municipal service demands (Ells, 1976).

Restrictions, often called easements, which are made either as gifts or are acquired at less cost than full purchase price, with some or all of the tax advantages listed above, may also be utilized to save habitats. Massachusetts has an excellent restrictions law (Chapter 666 of the Acts of 1969, as amended by Chapter 784 of the Acts of 1977), which recognizes conservation restrictions, historic preservation restrictions, and agricultural preservation restrictions (Dawson & Nickerson, 1978). Each is written as a partial-interest (less-than-fee) deed, registered with the state, and requires that the land on which it is in force be valued separately for tax purposes. Public access is not mandated, and occurs only if the owner so specifies in the instrument which creates the restriction. Local zoning in Massachusetts and such statutes as the Coastal Wetlands Restriction Act, the Scenic Rivers Act, the Scenic Roads Act and the Inland Wetlands Restriction Act further allow habitat preservation (Daw-

son & Nickerson, 1978). Requirements for public hearings under each law and the Open Meeting Law guarantee opportunity for input. Acquisition of the fee, or total ownership, has been and will continue to be the major means of habitat preservation. Private groups, associations, and trusts again are a potent force in such activities. The Nature Conservancy, active throughout New England, is an excellent example (Anon., 1978). Local land charitable trusts exist in literally dozens of cities and towns, turning gifts of all kinds of assets into tangible purchases of specific habitats. Enabling legislation exists in each New England state to allow formation of city or town conservation commissions, staffed by citizens. In Massachusetts, which invented the concept in 1957, 36 of 39 cities and 299 of 312 towns have established such commissions (Dawson & Nickerson, 1978). Until such legislation was put on the books, acquisition of any land had to be for specific municipal purposes which had never included conservation or habitat preservation for its own sake. These commissions, as arms of local government, can seek funds from town meetings (thus involving many people); can accept land gifts and recommend land purchases, which they will then manage and control; and at least in Massachusetts, these commissions regulate removal, dredging, filling, or altering of wetlands of all kinds. If the town so votes, the selectmen may use eminent domain powers to acquire land for conservation purposes. Eminent domain procedures also permit full acquisition of lands with unknown owners, or of fractional ownerships, often at great savings to the municipality. Conservation commissions in Massachusetts have been responsible for setting aside 50,000 acres of habitat, approximately 1% of the state's area. State parks and forests total 250,000 acres, or about 5% of the total area. We have three laws to encourage municipal acquisition of habitat: (1) the Self-Help Act, which reimburses costs up to 50% of the purchase price for land devoted to passive recreation and maintained in their natural state. This fund has disbursed \$18 million over the twelve years of its existence. (2) The Urban Self-Help Act, which received an initial capitalization of \$5 million, reimburses up to 80% of the costs of acquisition of parks for active recreation. (3) The Agricultural Preservation Restriction Act, also initially capitalized at \$5 million as a pilot program, helps farmers stay in business rather than sell the prime agricultural land for development. These laws, their proce-

dures and sample instruments are all discussed in Dawson and Nickerson (1978).

One of the major concerns today, which we can perhaps diagnose as a variant of Proposition 13 fever, is whether we can afford to purchase and thus withdraw any lands from development. However, habitat preservation has its positive economic values as well. Wetlands, because of their roles in flood control, water storage, adsorption of heavy metals, pesticides, and phosphates, and in denitrification (Nickerson, 1978), perform service conservatively valued at over \$140,000 per acre, according to a recent Tufts study (Thibodeau & Ostro, 1979). Open land generates desirability for proximal sites. Dennis, a Cape town in Massachusetts, has acquired nearly 600 acres of a projected 1200 acres conservation program. Its equalized (100%) valuation tax rate is \$14 per thousand, stable for the past five years. One of the prime factors keeping that real estate desirable is the proximity of guaranteed open space to many of the town's living areas (Town Clerk of Dennis, 1979).

In a forthcoming book, Robert A. Lemere, Chairman of the Conservation Commission of Lincoln, Mass., discusses open-space acquisition studies which compare costs resultant to municipal acquisition with those following development. He shows that in many Massachusetts towns, purchase costs through taxes are initially less and will continue to drop due to amortization of debt, while such costs will be more and continue to rise with maximum development of the same space, as greater demands are made on municipal school, fire, police, roads, water, and other town services. The economic lesson is clear. Conservation of habitat translates into conservation of the tax rate. Land values will never be any lower: purchases made now recoup their cost rapidly and the benefits of such open space to the surrounding human community, as well as the biological community existing there, continue indefinitely.

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